Reports and Comments

Animal Welfare welcomes the submission of items for this Reports and Comments section of the journal. These are accepted for publication at the discretion of the Editorial Office and are not peer-reviewed.

The capacity of Cephalopods and Decapods to experience pain and suffering

A new report has been by produced by Advocates for Animals, '*Cephalopods and Decapod Crustaceans: Their Capacity to Experience Pain and Suffering'*, calling on the UK government to include such species in the definition of 'animal' in the new Animal Welfare Bill (for England and Wales) and Animal Health and Welfare (Scotland) Bill. In the UK, the common octopus (*Octopus vulgaris*) is currently the only invertebrate included in the Animal (Scientific Procedures) Act 1986. In summarising the research on the capacity of cephalopods (octopus, squid, cuttlefish and nautilus) and decapod crustaceans (lobster, crab, crayfish) to experience pain and suffering, the report argues that the available scientific evidence is such that these species should be given the benefit of the doubt and be included in the new legislation.

The report begins with the executive summary in which the information and evidence contained within the body of the report is outlined. Both contain eight chapters: 'The scope of animal protection law'; 'The need for protection'; 'The assessment of capacity for suffering'; 'What types of evidence can show the capacity for pain and suffering?'; 'Evidence regarding decapod crustaceans'; 'Evidence regarding cephalopods'; 'Public policy and legislation concerning decapod crustaceans and cephalopods'; and 'Conclusion'.

The first chapter begins by describing the protection afforded to cephalopods and decapod crustaceans, or lack thereof, both in the UK and overseas, followed by a chapter outlining the need for protection. Instances that may give rise to suffering, such as catching, trapping, handling, storing etc, are mentioned, predominantly in relation to the use of these species in the food industry. Of particular concern in the report is the handling of lobsters, which are typically boiled alive without anaesthesia or pre-stunning.

The third chapter discusses how we can determine whether animals have the capacity to feel pain. The 'argument by analogy', which assumes that events that produce a particular response in humans (eg pain) are likely to have the same or similar effects in animals with similar physiological and behavioural characteristics, is discussed, with particular focus on how far across the evolutionary spectrum this argument can be used.

In terms of types of evidence that may demonstrate the capacity for pain and suffering, the report lists the following:

• "the animal has a nervous system and physiological mechanisms that make it, in principle, capable of experiencing pain or distress, and;

• the animal behaves in a way that we would interpret as a response to experiencing pain or distress; for example, by trying to escape…;

• related to this, it is thought to be more likely that an animal can experience pain if its brain and nervous system allow it to have more understanding about its environment and what is happening to it. Evidence for this comes from proof of [the] capacity for learning, remembering, generalising, making choices and modifying behaviour to the appropriate circumstances".

The report asserts that although there has been relatively little scientific research on invertebrates, cephalopods and decapod crustaceans fulfil all three criteria. More detailed evidence showing that these animals can experience pain is described, including the role of nociception (we assume in humans and other vertebrates that nociception creates nerve impulses that give rise to relevant sensations and associated fear and distress), the presence of similar neurochemical and physiological responses to stimuli that cause pain in vertebrates (eg opioid molecules), and similarities between stress systems in vertebrates and invertebrates (eg the presence of adrenocorticotrophin in both). In addition, evidence is provided in relation to the nervous and sensory systems, learning and behaviour, and physiological stress during catching, handling and transport.

The report provides a thorough overview of the evidence in favour of the capacity of cephalopods and decapod crustaceans to experience pain and suffering and is well referenced throughout with up-to-date scientific publications and research. However, it cannot be considered a balanced review due to the omission of an assessment on the opposite view, that such species do not have the capacity to experience pain and suffering.

Cephalopods and Decapod Crustaceans: Their Capacity to Experience Pain and Suffering (2005). Produced and published by Advocates for Animals, 10 Queensferry Street, Edinburgh, Scotland EH2 4PG, UK. 20 pp A4 paperback. Hard copies available free of charge from the address above. Also available to download at http://www.advocatesforanimals.org/pdf/crustreport.pdf

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UFAW

New website on the use of isogenic strains of mice and rats

Dr Michael Festing, the geneticist, statistician and laboratory animal scientist, and member of the UK Animal Procedures Committee and the Board of the National Centre for Reduction, Replacement and Refinement, has recently launched a website dedicated to the use of isogenic strains of mice and rats in biomedical research. On the website, he discusses the advantages and disadvantages of using such animals along with alternative 'outbred' animals. Isogenic strains are like 'immortal clones' of genetically identical

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individuals and have been used in research for decades, particularly in the field of genetics.

The aim of the website, as set out on the home page, is to reduce the number of animals used in research and to improve the quality of such research through the choice of more appropriate strains of animals. The website consists of 10 web pages (including the home page) which explore the arguments in more detail: Overview, Ethical Considerations, Isogenic Strains, Outbred Stocks, Multi-strain Experiments, Derived Strains, FAQs, Literature, and About. The toolbar on the left-hand side of each page contains links to all pages, thus aiding navigation around the site.

The page entitled 'Overview' sets out the reasons why isogenic strains are preferable to outbred stocks in biomedical research, describes the properties of both, and explains how isogenic strains should be used. The author states that "… the use of outbred [strains of] rats and mice is no longer ethically, scientifically or economically acceptable unless specifically justified. It leads to poorly designed experiments which waste animals, money and scientific resources, and slows the pace of research." There then follows a list of reasons why using outbred strains can often be considered 'wrong', and a brief discussion of each of the four major classes of mice and rats used in research: outbred stocks; isogenic strains; mutants and polymorphisms; and genetically modified animals.

The page entitled 'Ethical Considerations' examines the use of isogenic strains in the context of animal welfare, through discussion of the Three Rs principle. Much of the focus is on 'reduction', which is the most relevant given the assertion that the use of isogenic strains reduces the numbers of animals required for experiments. Both pages relating to 'Isogenic Strains' and 'Outbred Stocks' define the terms more clearly and include details of the nomenclature and general properties of each, whilst the page on 'Multi-strain Experiments' is rather complex and is perhaps best reserved for those actively involved in this type of research.

A useful FAQs page is included which answers the most common questions posed on this subject in a clear and logical manner. Such questions include 'How can I use more than one inbred strain without increasing the total number of animals which I use?', 'What if the inbred strain I chose were to be genetically resistant to the chemical [being tested for toxic effects]?', 'Is the use of outbred stocks ever justified?', and 'Is there any type of research for which inbred strains are unsuitable?'

Further information including a list of peer-reviewed papers (including the abstracts) can be found on the page entitled 'Literature', whilst the page 'About' contains detailed notes on the website's author. Given that the website is aimed primarily at those using mice and rats in biomedical research, those less familiar with this field may find some of the concepts and discussions rather complex, particularly the section on multi-strain experiments. It is, however, a very useful tool for those in this field and sets out clearly the benefits to animal welfare of using isogenic strains.

Festing M (2005) Website on the use of isogenic strains of mice and rats: www.isogenic.info

NB This website is still under construction and as such its contents is subject to change.

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A guide to animal welfare and its assessment in zoos

Conceived as a supplement to the UK Secretary of State's Standards of Modern Zoo Practice (SSSMZP), the Zoo Forum Handbook seeks to act as a 'living' document that reflects new developments in animal management and best practice. Like previous chapters, which dealt with 'The ethical review process', 'Conservation and education and research' and 'Sustainability initiatives in UK zoos', the latest — on 'Animal welfare and its assessment in zoos' — does not seek to be an exhaustive source of information. Rather, it aims to assist zoos and zoo inspectors through the addressing of key animal welfare issues that should be of concern to the zoo community, and by providing guidance on where further information on these can be sought.

The first section of the chapter lays out the principles and concerns that inform what follows, including the authors' premise that concern for animal welfare is based on 'the quality of subjective feelings' experienced by an animal and that the welfare goals of zoos should be: "to minimize risks of poor welfare, to recognize and deal promptly with welfare problems and to play a role in advancing knowledge of zoo animal welfare".

The chapter then addresses the means by which animal welfare can be assessed. The SSSMZP specifies many resource (or environmentally) based indices that could be used to assess welfare, but as the chapter points out the use of animal based indices, although more subjective and difficult to obtain, offer a direct means of assessing the welfare of the animal itself. A variety of 'tools' that could be used to assess welfare — characterized as behavioural, physiological or clinical and pathological — are then described, including why each may be useful, an example of how each has been used and any caveats and/or limitations of the tool. Tools detailed include: assessment of approach/avoidance behaviour and apathy as indicators of welfare status; heart rate and immune measures as tools of welfare assessment; and the use of health and husbandry records.

Another area of note outlined in the chapter are the recommended roles and responsibilities of keepers, senior keepers, curators and zoo inspectors in the assessment and auditing of welfare. The Handbook argues that to maintain high standards, best practice indicates that a welfare audit should be carried out as a biannual or annual event, with the core activity of such an audit being the review of records of veterinary and husbandry matters by senior management so that priority areas of action to address welfare concern are highlighted. Also outlined is the need for staff to keep abreast of scientific developments in our understanding of animals and their needs and the role for zoos in refining such

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